AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A copper alloy for welding electrodes, ~~characterized in that~~wherein the copper alloy contains~~,~~ as ~~a~~ second element, which ~~that~~ does not dissolve or scarcely dissolves in copper in a solid solution state at room temperature, said second element being selected from the group consisting of ~~any of~~ chromium (Cr), zirconium (Zr), beryllium (Be), titanium (Ti) and boron (B), ~~the~~ respective addition ratios of the second ~~elements~~ element being Cr: 0.1 to 1.4 wt%, Zr: 0.15 to 0.5 wt%, Be: 0.1 to 3.0 wt%, Ti: 0.1 to 6.0 wt%, B: 0.01 to 0.5 wt%, ~~in that this~~and wherein the alloy has an average crystal grain size of not more than 20 μm, ~~in that~~ the second ~~elements~~ element precipitates among crystal grains, and ~~in that~~ the copper alloy has a hardness of not less than 30 HRB, an electrical conductivity of not less than 85 IACS%, and a thermal conductivity of not less than 350 W/(m·K).

2. (Cancelled)

3. (Cancelled)

4. (Cancelled)

5. (Currently Amended) A method of manufacturing a copper alloy for welding electrodes, comprising the steps of:

~~characterized in that the method comprises~~ enabling any of chromium (Cr), zirconium (Zr), beryllium (Be), titanium (Ti) and boron (B) to dissolve in a solid solution in a base-material metal (Cu) as a second element that does not dissolve or scarcely dissolves in copper in a solid solution state at room temperature, ~~the~~ wherein respective addition ratios of the second ~~elements~~ element being Cr: 0.1 to 1.4 wt%, Zr: 0.15 to 0.5 wt%, Be: 0.1 to 3.0 wt%, Ti: 0.1 to 6.0 wt%, B: 0.01 to 0.5 wt%,

~~subsequently achieving crystal grain refinement by~~ applying a strain equivalent to an elongation of not less than 200% to this material to achieve crystal grain refinement, and

-subjecting this material to aging treatment simultaneously with or ~~after the~~subsequent to application of this strain, thereby ~~to promote~~ promoting precipitation of the second element among crystal grains.

6. (Cancelled)

7. (Currently Amended) The method of manufacturing a copper alloy for welding electrodes according to claim 5, ~~characterized in that means for applying a strain to the material~~ strain is applied to the material by ~~is~~ any of ~~extrusion~~ extruding, drawing, shearing, rolling and forging.

8. (Currently Amended) The method of manufacturing a copper alloy for welding

electrodes according to claim 7, ~~characterized in that conditions for the extrusion~~ wherein strain is applied by extruding the material, and extrusion conditions are such that lateral extrusion is performed at a material temperature of 400 to 1,000°C, a die temperature of 400 to 500°C, and an extrusion speed of 0.5 to 2.0 mm/sec.

9. (Currently Amended) The method of manufacturing a copper alloy for welding electrodes according to ~~any of claims 5, 7 or 8, characterized in that~~ claim 5, wherein the material is subjected to aging treatment before a strain is applied to the material~~,~~ ~~the material is subjected to aging treatment beforehand~~.

10. (Currently Amended) A composite copper material for welding electrodes, ~~characterized in that~~ wherein an alumina powder or a titanium boride powder is dispersed in a copper matrix in an amount of 0.1 to 5.0 wt%, said ~~and in that this~~ composite copper material has a hardness of at least ~~not less than~~ 30 HRB, an electrical conductivity of ~~not less than~~ at least 85 IACS%, and a thermal conductivity of ~~not less than~~ at least 350 W/(m·K).

11. (Cancelled)

12. (Cancelled)

13. (Cancelled)

14. (Currently Amended) A method of manufacturing a composite copper

material, comprising the steps of:

mixing ~~that comprises mixing~~ a copper powder and a ceramic powder together to forming ~~, thereby to form~~ a mixed powder as a primary shaped body, and applying a strain to said ~~this~~ primary shaped body~~, thereby~~ to form a secondary shaped body in which base material and ceramic particles are combined together with refined particle sizes,

wherein ~~characterized in that the~~ an average particle size of the ceramic powder is between about 0.3 to 10 μm, ~~in that a~~the strain applied to the primary shaped body is equivalent to an elongation of not less than 200%, ~~in that the means for~~ the strain is applied by extruding the primary shaped body ~~applying a strain is extrusion~~ that is performed at a material temperature of not less than 400°C but not more than 1,000°C and a die temperature of not less than 400°C but not more than 500°C, ~~in that the~~ wherein an average particle size of a base material of the secondary shaped body to be obtained is not more than 20 μm, and ~~in that~~ the average particle size of ceramic particles is not more than 500 nm.

15. (Cancelled)

16. (Currently Amended) The method of manufacturing a composite copper material according to claim 14, ~~characterized in that~~ wherein the primary shaped body is obtained by green compacting or by filling the mixed powder in a tube.

17. (Cancelled)

18. (Currently Amended) A method of manufacturing a composite copper material in which titanium boride is dispersed in a copper matrix, ~~characterized in that the method comprises~~comprising the steps [1] to [3] ~~below~~of:

[1] ~~the step of~~ mixing a copper powder, a titanium powder and a boron powder together~~, thereby~~ to form a primary shaped body;

[2] ~~the step of~~ applying thermal energy to the primary shaped body~~,~~ and thereby causing the titanium powder and the boron powder to react with each other in order to form titanium boride in ~~a~~ the copper matrix; and

[3] ~~the step of~~ applying a strain to the primary shaped body, in which the titanium boride is formed, by plastically deforming the primary shaped body~~,~~ and thereby ~~to form~~ forming a secondary shaped body.

19. (Currently Amended) The method of manufacturing a composite copper material according to claim 18, ~~characterized in that~~ wherein the secondary shaped body is subjected to heat treatment while ~~in the same step as the step of~~ applying ~~a~~ the strain by plastic deformation ~~or a step following this step~~ or following application of the strain.

20. (Currently Amended) The method of manufacturing a composite copper material according to claim 18, wherein ~~or 19, characterized in that the~~ plastic deformation involves applying a strain equivalent to an elongation of not less than 200%.

21. (Currently Amended) The method of manufacturing a composite copper

material according to ~~any of claims 18 to 20, characterized in that~~ claim 18, wherein the plastic deformation is extrusion that is performed at a material temperature of not less than 400°C but not more than 1000°C.

22. (Currently Amended) The method of manufacturing a composite copper material according to ~~any of claims 18 to 20, characterized in that~~ claim 18, wherein the plastic deformation is extrusion that is performed at a die temperature of not less than 400°C but not more than 500°C.

23. (Currently Amended) The method of manufacturing a composite copper material according to ~~any of claims 18 to 22, characterized in that~~ claim 18, wherein the primary shaped body is obtained by green compacting or by filling a mixed powder in a tube.

24. (Currently Amended) The method of manufacturing a composite copper material according to ~~any of claims 18 to 23, characterized in that~~ claim 18, wherein ~~the~~ an average particle size of the ceramic powder is 0.3 to 10 μm, ~~in that the~~ an average particle size of a base material of the secondary shaped body to be obtained is not more than 20μm, and ~~in that the~~ an average particle size of titanium boride particles is not more than 500 nm.